ON THE INVESTIGATION

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OF THE

PREVALENT DISEASES OF THE DISTRICT,

BY MEANS OF A

SYSTEM OF REGISTRATION,

ROYAL COLLEGE OF SURGEONS OF ENGLAND
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BY

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Mr. President and Gentlemen,

The consideration of the diseases which prevail or are frequent in the district is one of the main objects of this society, and forms a portion of our daily occupation. As such it has always formed a most interesting and instructive part of our meetings. By its means discussion is promoted, and a friendly interchange of opinions is imperceptibly advanced. This intercommunication of ideas is conducible to a good result, not only by counteracting feelings of reserve, but by stimulating individual members to note their observations, and in this wise unconsciously acquire more precision in the description of disease. Many important facts and valuable suggestions are imparted from one to another; they are thus preserved, and in addition may be suggestive of new notions in other minds. By the mere mention that a contagious and epidemic disease is raging in a district, a warning is given to others in distant parts, who at once have their attention riveted to the probability of their own district becoming similarly affected, make timely preparations for the approach of the enemy, whose course may happily be intercepted, and the magnitude of the calamity lessened. This is especially the case with what may be termed the fresh epidemic diseases, or those which are new in a district—as the occurrences of diphtheria, within the last few years. If we were not, in this way, made acquainted with the peculiarities or characteristic symptoms of such diseases, how could they, with any certainty, be recognised by those who had been precluded the opportunity of observing them? Again, the more severe epidemic diseases are frequently preceded by a similar but milder disease, the resemblance being in the similitude of the symptoms, the mild disease giving a timely warning, or occupying the position of herald to the graver diseases. These forerunners are to be regarded, and the incidents which are happening to others heeded, for by such means we may, peradventure, prevent, mitigate, or arrest the violence of an epidemic outbreak.

The attentive watching of the prevalent diseases is the best conductor for the elucidation of the causes of disease, and, by the clearing up of the sources from which disease originates, a bright light will in time point towards the remedy to be employed in the prevention and combating thereof. If, by any possibility, we mitigate the outbreak of one epidemic disease, we are not only rendering service to the public by screening them from that disease alone, but from others also, which may follow closely on its footsteps, and be of a much more fatal character.

When it is considered, how exceedingly rare it is, for even a single individual, and certainly for no collection of people to pass through an outbreak of a contagious or epidemic disease, without being taken possession of thereby, unless impenetrability to the influencing effects has been rendered by a former attack of the same disease. All our efforts should be roused to the investigation of these important subjects. For, how often it happens, in those who have recovered from an attack of one of the epidemic diseases, that the constitution is so weakened, that the former state of health is never re-attained, or if the health appears to be re-established, the ground is all prepared for the more ready occupation by some other disease of the same character; or, after a varying time, the health gradually declines, the strength yielding, without any organic disease being discoverable. In certain persons, who have suffered from typhoid fever, when convalescence has been established, in a short time a deposit of tubercle is suddenly manifested in the lungs, which rapidly passes through its different stages.

The study of epidemic diseases calls for our best energies, and is yet quite in its infancy. The labourers have only passed the threshold. This is not from the number of those thus employed having been small, or from the workers having been idle or unable to solve the many difficult problems. A large portion of those who have selected this field for their labour, have been from the foremost ranks of men of science, and have shown an affection for their work which could with difficulty be excelled; even some, by their devotion, have sacrificed their very lives. In a measure, the scanty result may have been caused by some of the enquirers having only prosecuted their researches during the time when an epidemic was prevalent, and not also when absent. It is absolutely necessary that the enquiry should be continued after an epidemic has passed away. When an epidemic disease unhappily visits a neighbourhood all the community become excited, all thoughts are roused, some facts may possibly be observed, and the cause of the visitation conjectured; but when the mortality again fortunately declines and the health of the locality returns to its former condition, those thoughts which had been occupied with such fearful forebodings become engaged with other subjects, and all the distressing circumstances are soon forgot, or certainly remembered as of the past.

It may be in some favoured district that an official enquiry is instituted, and after a certain time occupied in eliciting evidence and the examination of witnesses, a report is published, which necessarily cannot be complete, because the most important element for its perfection is wanting, namely, reliable data upon which to base the deductions.

The diseases which prevail or have most influence on the community are those which belong to the contagious and epidemic class, or, according to the nosology of the registrar-general, the zymotic division of diseases. What the exciting cause of these diseases is, whether they are due separately or conjointly to changes in the temperature, moisture, pressure, composition, electric condition, or the amount of ozone in the atmosphere is not the object of this consideration ! But of all these causes that the changes in the temperature perhaps occupies the first position will readily be admitted. In great changes or extremes in the temperature, a corresponding increase or decrease of sickness is always noted. In a very hot summer derangements of the viscera connected with the mucous membrane of the stomach and intestines occur, that extensive internal tract reciprocates with the surface of the body, under the agency of external heat; on the contrary, in extreme cold weather, the mucous membrane of the air passages becomes affected, and the important structures in contiguity suffer.

Season has a great influence upon certain diseases. Of all the seasons, the registrar-general thinks that summer is the healthiest, winter the most unhealthy. This is the reverse of what was the case in former times, when the number of deaths occurring in the summer always greatly exceeded those in the winter. At the present time, the winter mortality is by far the greatest, unless an epidemic outbreak has occurred to swell the list of summer deaths. This is an evidence of the good effect of legislative interference in the establishment of sanitary measures in most of the large towns.

The entire class of infectious and epidemic maladies exhibit variations, not only in intensity, but also in fatality, from year to year. These propositions are illustrated by the following calculations, which have been made from the reports of the dispensary in this town, for the last ten years. The per centage of cases of a few selected diseases, in comparison with the whole number of medical cases treated at that institution in one year, is as follows :—

DISEASES.	Smallest number of Cases.	Greatest number of Cases.	Ratio or frequency.
Variola	0·2	5·0	1 : 25
Rubeola	0·1	6·0	1 : 60
Scarlatina	0·2	7·9	1 : 40
Pneumonia	1·3	2·4	13 : 24
Bronchitis.........	15·5	23·4	2 : 3

In the diseases variola, rubeola, and scarlatina, all produced by some alteration in the constitution of the blood, the fluctuations in the number of cases is very considerable; whereas in pneumonia and bronchitis, diseases primarily due to some structural alteration, the variations are very small. These numbers necessarily are only a representation of the number of cases of these diseases, in this town, in the time stated ; the cases at the Fever Hospital are not included, and those that were under the observation of private practitioners, could not be obtained; however, they are sufficient for the present purpose.

As an illustration of the proposition that the fatality of these diseases is very variable, in comparing one year with another. Thus, in the same ten years, the per centage of deaths from variola, taking the whole number of cases in each year, was as low as 6·0, and as high as 23·4, or four-times as fatal ; from rubeola as low as 0·9, and as high as 17·0, or eight-times as fatal ; from scarlatina as low as 2·6, and as high as 20·0, or eight-times as fatal.

It is also deserving of note, that the peculiar powers, whatever they may be, do not influence all these diseases to the same extent. In the years when variola was most prevalent, rubeola was nearly absent—this occurred in the years 1856 and 1859; also when rubeola was very prevalent, variola was nearly absent ; this was in the years 1854 and 1857. Scarlatina did not follow any rule of this kind, having been prevalent or not so, in the years when variola and rubeola were frequent or rare.

These facts go far to prove that the poisons of this class of diseases are all distinct, and probably that the peculiar principle producing each of these diseases is always present, but rendered active by the various atmospheric changes, and only then capable of producing a deleterious effect upon the human constitution.

It may be said by some, that the right way to investigate the violence or strength of an epidemic is to refer to the number of fatal cases, during a visitation. Without doubt, this mode of procedure will illustrate the fatality of an epidemic, but cannot show its magnitude. In all epidemic outbreaks the number of recoveries and deaths must be compared with each other, with the number of those affected, and with the aggregate of those who have escaped. In this manner a measure is obtained of the severity of the epidemic, from time to time, in the same outbreak, and in former visitations of the same disease. If the explanation of the causes of epidemic diseases has to be sought by a reference to the number of deaths, this is too long deferred. The mortality of a disease is, by no means, an accurate measure of its prevalence. It is true, that from the right statements of the fatality of an epidemic, some lives may be saved, it may be, from the institution of more stringent sanitary measures. We must strive for something more than this. The earlier of those who are stricken down must be endeavoured to be saved. This can only be hoped for by having some " mark " or " sign " to guide us, some " caution," or rather "previous notice," which is to be gained by the regular observation and registration of the diseases which are daily prevailing in the district.

Having indicated some of the advantages that would be gained by studying more closely the diseases which are prevalent, I would now direct your attention to the manner in which this may be accomplished, or sketch out a system for adoption by this society, that may be both agreeable and profitable to the members. The idea first suggested itself to my mind about six months ago, when I had the honour of being invited by my much esteemed friend, Dr. White, to prepare a plan for a statistical paper on the diseases of this town and neighbourhood for the meeting of the British Association in this town last August. The scheme was most reluctantly abandoned by the sub-committee appointed for the special purpose, and was mainly caused by the shortness of time, and the difficulty experienced in obtaining suitable material for the undertaking.*

When occupied with the various tables for this paper, it appeared to me that the employment of a methodical form of registration, by means of tables, would be a most valuable system in the investigation of disease, and it is this which I shall now attempt to delineate. Before doing so, I may be permitted shortly to review the plan hitherto adopted at the meetings, for the carrying out of the object of this society, styled " mutual intercommunication respecting the prevalent diseases of the district."

It has been the custom for individual members to relate or refer to any case of interest, more especially those of the epidemic class, that may have occurred in their sphere of observation. and for this statement to form the basis of a general discussion, either composed of a series of questions, or by a reference to similar cases, confirming what has been said. This method has undoubtedly many advantages, but it only goes so far. It stops short of the great objects in view. The statements are wanting in precision, they are merely general No record can, with any possibility, be kept. That exactness is wanting which is necessary for the purpose of collation, hence deductions, obtained by the analysis of facts, are here unattainable.

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* The paper was entitled " A statistical account of the medical cases which have been treated at the Newcastle-upon-Tyne Infirmary, Newcastle Dispensary, Newcastle Fever Hospital, and Gateshead Dispensary, during the last —— years, with the deductions arising from the comparisons of the deaths, recoveries, and treatment." The paper was illustrated by several tables.

A better system, and one upon which entire reliance could be placed, is a plan of registration, for the recording of facts, whereby at brief intervals of time, tables are filled up, bearing on the existence of certain diseases, occurring in different localities, in the same period of time.

In a system of registration it would be necessary—

1.—To collect facts.

2.—To classify and compute the facts.

In the collection of the facts two elements are needful—

A.—To ensure the assistance and co-operation of the whole available scientific strength of the district.

A single individual can do little without the help of others, in the carrying out of any plan. From his isolated position, the vast extent of the population, the great difference of circumstances in which they are placed, it is clear that a result, and that even greatly deficient in the approximation to perfection, can only be obtained by the united and devoted efforts of a band of workers. For as in mechanics, power is obtained by a combination of forces, all directed to the same object, so in the investigation of some of the recondite problems in the science of medicine, a leaguing together of those so employed is absolutely necessary. The advantages that would accrue, as well as being of general value, would redound upon each individual. In the words of the Registrar General, "the register of the medical practitioner would, at the end of a few years, be of incalculable interest to him; he might refer back to it for important information, transmit it to his sons or successors in practice, analyse the results of his experience, and, in conjunction with his brethren all over the country, would ultimately accumulate a large mass of materials which could not fail to advance medical science;" and as "medical science is based upon extended observations," the collected notes of a number of individuals scattered over a district would do far more for the advancement of this science than the writings of single individuals, no matter how highly gifted in power of observation and writing they might be.

B.—The second element needful for the collection of facts is—

Uniformity in the system of observation, consisting of a simple and easy mode of recording the notes.

In the classification and computation of the facts, a properly constituted plan would have to be fixed upon, which could best be carried out under the direction of a central authority, independently of the observers of the facts.

The subjoined tables represent a system, in which all the numbers are purely hypothetical.

In Table I., which may be regarded as the most simple, and that upon which all the others are founded, the first vertical space is occupied by the names of certain diseases; then come other five vertical spaces, for as many weeks, each is sub-divided into three divisions, headed new cases, recoveries, and deaths; the last vertical space is for any remarks. In the filling up of this table it is simply necessary to insert the number of cases of the particular disease in each week, under its proper heading.

For example, if we take variola, in the week ending October 7, two new cases, one recovery, and no deaths took place; in the week ending October 15th, one new case, no recovery, and one death occurred, and so on.

In Table II., which may be either in three sections, A B and C—new cases, recoveries, and deaths, or fused into one extended table. The diseases are again arranged in the first vertical space, and the other primary spaces are sub-divided, the divisions being made according to the ages; first into all, then under 20, from 20 to 40, from 40 to 60, and lastly 60 upwards. A division is further made for the sexes, and in the sections B and C the divisions for the two sexes are again sub-divided into two, N the number of cases, and D the number of days affected.

Section C has not been drawn, because it is exactly similar to section B.

If the disease variola is again taken: In section A, in the week ending October 7th, one male and one female were newly affected; the male was between 40 and 60 years old, and the female between 20 and 40. In section B, in the week ending October 7th, the recovery occurred in a male, whose age was between 20 and 40, and who had been 18 days affected.

In the tables I. and II., the divisions are made into weeks, so that the observations may be arranged into the same periods of time, while it is extended over four or five weeks.

In these tables, which could be prepared in sheets, each practitioner might readily note his individual cases, and any number of such sheets could, with little hindrance, be coalesced together, by the simple process of addition, at stated periods of time, and the aggregate represented, as in table III., which has reference to each special disease; section A, representing the number of cases of one disease, in one month, in various important towns in the counties of Northumberland and Durham; section B exhibiting the same, in the various months of the year, in one town.

In section A, in the first vertical space, are seventeen of the most important towns in the two counties named; in the other vertical spaces are arranged the number of cases, in the first from 1 to 5, from 5 to 10, from 10 to 20, from 20 to 50, and lastly from 50 to 100. The marks with the connecting lines indicate the number of cases.

The disease taken is variola, and the month of the year is January. In Newcastle there were 4 cases; in North Shields, not any; in South Shields 8, and so on.

In section B in the first vertical column, the months of the year are arranged, in the others are the number of cases.

The town taken is Newcastle, and the disease is variola. In January 4 cases appear; in February 6; in March 8, and so on.

Table IV. represents Table III. extended, and may be called the year table, or the annual record of the number of cases of any disease. The arrangement is made under the heading of the different months, in connection with the various towns selected. The horizontal comparison shows the severity of the disease in the various months of the year in the same town. The vertical comparison represents the same disease, in one town, in a single month, as compared with other towns.

This whole scheme could most advantageously be carried out by this Society. Numbering as it does, in its list of members, nearly one hundred of the most eminent men of the profession in the two counties, the results of this plan would very soon be evident; and, even, under the auspices of this Society, other gentlemen, too far resident to become members of this Society might be invited to co-operate and lend their aid in this important work.

As the meetings of this Society are arranged to take place once a month, on the second Thursday evening of the month, the collected observations might extend over the same period of time, and be made up to the first Thursday of the month, thus allowing a few days for their transmission and combination before the meetings. This arrangement would entail a return of five weeks instead of four to the month, once in every three months, caused by the interval between the meetings being prolonged; this would be the case in the months of February, May, August, and November. In Table I. this has been allowed for, space is there allotted for five weeks. In the short months, as they may be termed, the last week would be left blank. Each monthly statement would not be considered wholly as complete, a little delay might occasionally arise in the transmission of some of the sheets, but a correction could be made in the next monthly report, which could be used for the final combinations every twelve months, when the years' tables, with any deductions arising therefrom, would be published in the transactions of the Society. As no meetings are held during the summer months, the account of these months could be postponed until the first meeting of the following winter. All the communications would be received as confidential, there being no necessity for special reference to any practitioner. In the transactions a list might each year appear of those individuals who had contributed.

At the commencement of each meeting, the statement of the diseases prevalent in the two counties would be made, which would be received as official, and be a reliable starting point for the discussions. After a reference has been made to the diseases in the lists, any other cases of interest might be related or referred to.

In opposition to this system, it may be said, and justly so too, that this plan will entail a great amount of trouble, and engross the time of the often over worked practitioner. If it be remembered, that by the institution and working of this system, a great advance would be made in pathology alone, this objection will readily pass away from the minds of many. Further, it may be argued against this system, that the plan hitherto in force has worked well, that a change therefore is not desirable, especially as it necessitates the preparation and distribution of the tables, which would be attended with expense. If a change can be devised, likely to be beneficial, especially so, if that alteration is to advance science, it is quite justifiable to make that change. The expense that this system would lead to, cannot, with any possibility, be much; it would be a fair and legitimate way to employ part of the funds of the Society.

I am satisfied that this plan has many advantages, and if adopted by this Society, will be found easy of being worked, and productive of results of great worth. At first, a great deal must not be attempted, " large results are always obtained by small beginnings." The Registrar-General forcibly states in what way an undertaking of this kind is to be accomplished, he says, " engaged in the practice of a laborious profession, medical men should not attempt too much at first; ALL CASES should be noticed, but those facts should be chiefly recorded which are of an unequivocal nature, and that admit of precise statements in respect to number, time, weight, and measure." In accordance with this recommendation, I would commend to your notice Table I., as the most simple, and yet the most effective, and one which is capable of extension at any time.

If this numerical system were employed, a valuable stock of statistical information would be collected, which would form an instrument of great worth in research. There exists a national system of registration of the causes of death, so there might be, by our example, a corresponding national system of registration of the number of actual cases of disease, which would justly be called " vital statistics," and would indicate the resistance of one portion of the community against disease as compared with another. In addition, it would exhibit the sanitary condition of the district, and no doubt would cast a gleam on the means to prevent certain diseases, and the right understanding of their etiology, which is one of the greatest rewards of the worker in that wide expanse, " the science of medicine."

TABLE I.]

Place of Observation—*NEWCASTLE.*

OBSERVATION COMMENCING 1*st OCTOBER;* ENDING 4*th NOVEMBER*, 1863.

DISEASES.	Week ending 7th Oct.			Week ending 14th Oct.			Week ending 21st Oct.			Week ending 28th Oct			Week ending 4th Nov.			REMARKS.
	N.C.	R.	D.	N.C.	R.	D.	N.C.	R.	D.	N.C.	R.	D.	N.C.	R.	D.	
Variola . . .	2	1		1		1	1	1	1		1		1			All the cases Unvaccinated in All Saints' Parish.
Rubeola . . .	4	4			2	2		2								
Scarlatina . .	2		1	1	1			1					1			The cases in the week, 7th Oct., in one family.
Pertussis . .																
Croup . . .																
Diphtheria . .	1	1		1		1					1					
Influenza . .	4	2		3	3		2	3		1	2					
Typhus Fever .										1						
Typhoid Fever							1						1			
Cholera . . .	4	2	3	2	2	1	1				1					
Puerperal Fever				1										1		

N.C. New Cases. R. Recoveries. D. Deaths.

Observer ____________________

Residence ____________________

TABLE II.—*Section A.*

NEW CASES.

DISEASES.	Week ending 7th October.									
	AGES.									
	At all.		Under 20.		From 20-40.		From 40-60.		60 Upwards.	
	M.	F.	M	F.	M.	F.	M.	F.	M.	F.
Variola . . .	1	1				1	1			
Rubeola . . .	2	2	2	2						
Scarlatina . .	1	1	1	1						
Pertussis . . .										
Croup . . .										
Diphtheria . .	1				1					
Influenza . . .	3	1			2	1	1			
Typhus Fever . .										
Typhoid Fever . .										
Cholera . . .	3	1	1	1					2	
Puerperal Fever .										

Section B.]

RECOVERIES.

DISEASES.	Week ending 7th October.																			
	AGES.																			
	At all.				Under 20.				From 20-40.				From 40-60.				60 Upwards.			
	M.		F.		M.		F.		M.		F.		M.		F.		M.		F.	
	N.	D.	N.	D.	N.	D.	N.	D.	N.	D.	N.	D.	N.	D.	N.	D.	N.	D.	N.	D
Variola. .	1	18							1	18										
Rubeola .	2	7 9	2	6 10	2	7 9	2	6 10												
Scarlatina .																				
Pertussis .																				
Croup . .																				
Diphtheria .	1	8							1	8										
Influenza .	1	3	1	5					1	3					1	5				
Typhus Fever																				
Typhoid Fever																				
Cholera .	2	6 7							1	6			1	7						
Puerperal Fever																				

M Males. F. Females. N. Number of Cases. D. Days affected.

Section C.]

DEATHS.

PLACE OF OBSERVATION—*NEWCASTLE.*

Observation commencing 1ST OCTOBER; *ending* 4TH NOVEMBER.

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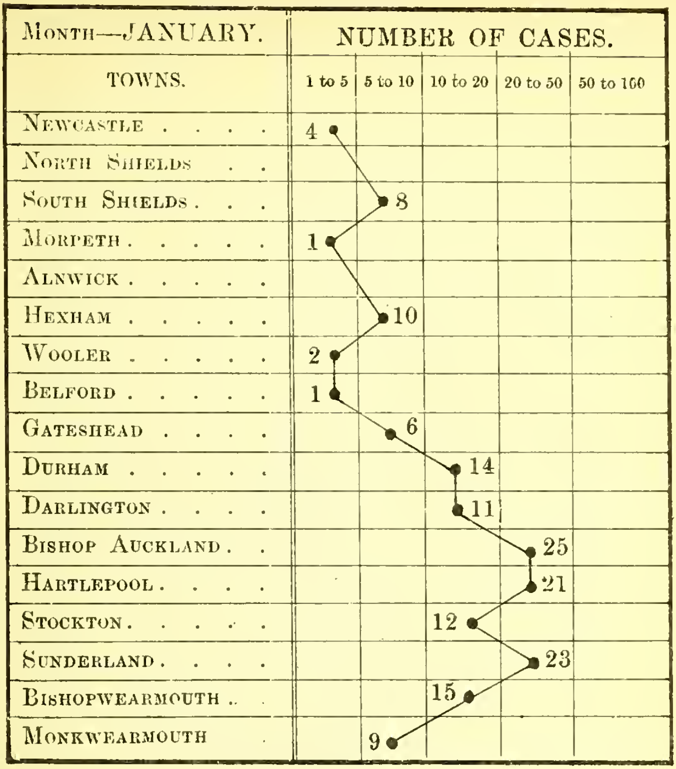
TABLE III.—*Section A.*

DISEASE—VARIOLA.

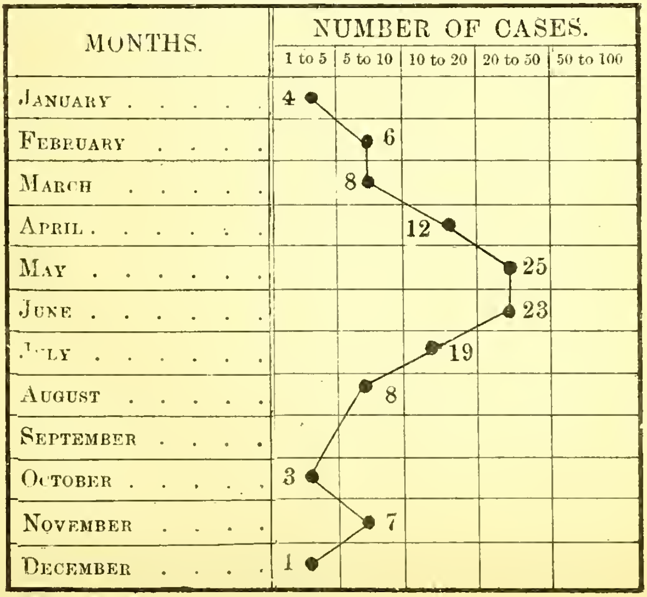


MONTH—JANUARY.	NUMBER OF CASES.				
TOWNS.	1 to 5	5 to 10	10 to 20	20 to 50	50 to 100
NEWCASTLE	4				
NORTH SHIELDS					
SOUTH SHIELDS		8			
MORPETH	1				
ALNWICK					
HEXHAM		10			
WOOLER	2				
BELFORD	1				
GATESHEAD		6			
DURHAM			14		
DARLINGTON			11		
BISHOP AUCKLAND				25	
HARTLEPOOL				21	
STOCKTON			12		
SUNDERLAND				23	
BISHOPWEARMOUTH			15		
MONKWEARMOUTH		9			

TOWN—*NEWCASTLE-UPON-TYNE.*

—*Section B.*]

DISEASE—VARIOLA.



MONTHS.	NUMBER OF CASES.				
	1 to 5	5 to 10	10 to 20	20 to 50	50 to 100
JANUARY	4				
FEBRUARY		6			
MARCH		8			
APRIL			12		
MAY				25	
JUNE				23	
JULY			19		
AUGUST		8			
SEPTEMBER					
OCTOBER	3				
NOVEMBER		7			
DECEMBER	1				

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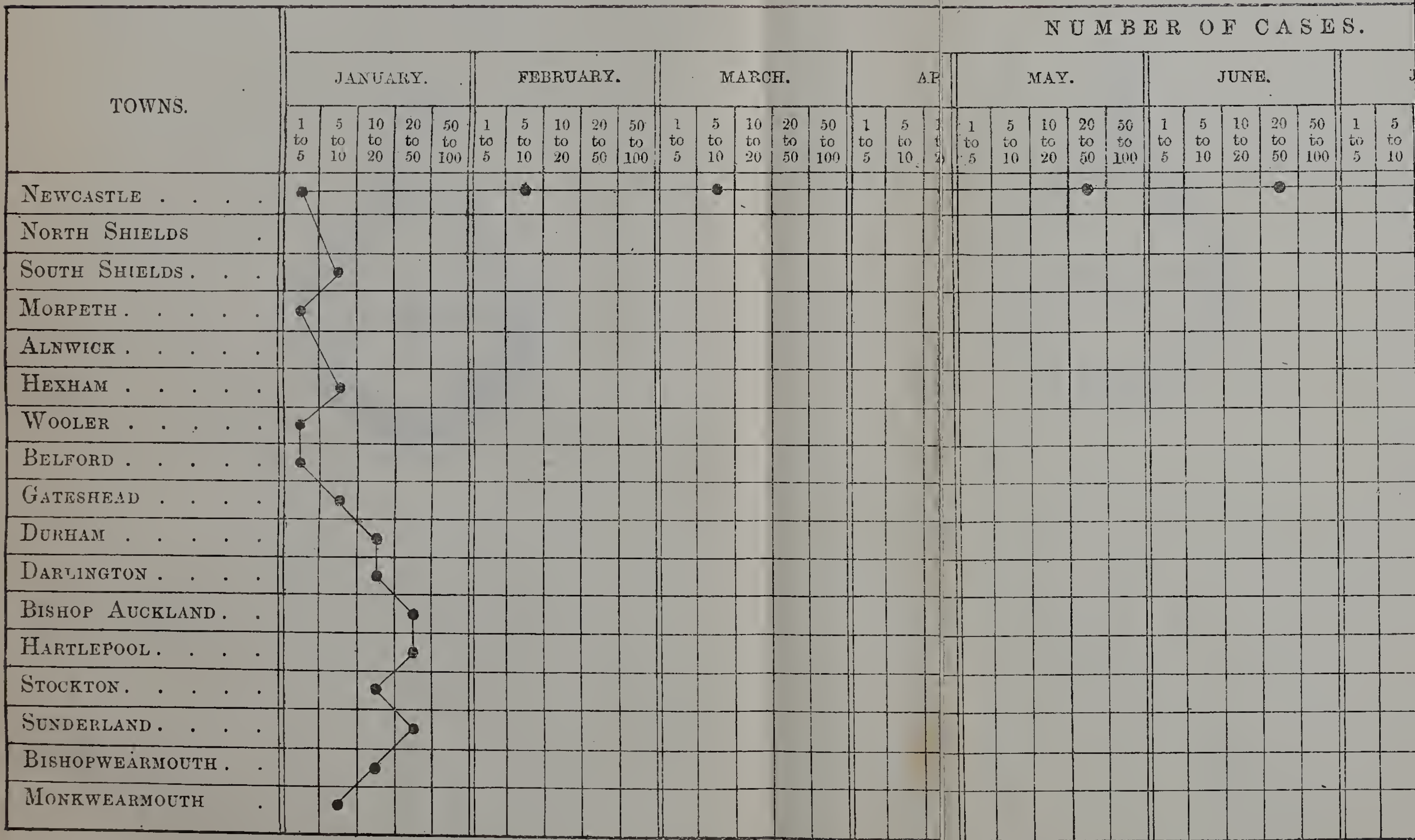
TABLE IV.]

DISEASE—VARIOLA.

YEAR—1863.



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